



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/678,011	10/02/2003	Bret A. Ferree	BAF-19202/29	9243
25006	7590	06/01/2006	EXAMINER	
GIFFORD, KRASS, GROH, SPRINKLE & CITKOWSKI, P.C PO BOX 7021 TROY, MI 48007-7021			CROWDER, CHUN	
			ART UNIT	PAPER NUMBER

1644

DATE MAILED: 06/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/678,011

Applicant(s)

FERREE, BRET A

Examiner

Chun Crowder

Art Unit

1644

– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 March 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) 8-24 and 26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. Applicant's election of antibody to TGF- $\beta$ 1 without the steps of adding other factors, medications or substances, filed 03/22/2006, is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 1-26 are pending.

Claims 8-24 and 26 have been withdrawn from further consideration by the Examiner, under 37 C.F.R. 1.142(b), as being drawn to nonelected inventions.

Claims 1-7 and 25 are under consideration in the instant application.

2. The application is required to be reviewed and all spelling, TRADEMARK, and like error corrected.

Trademarks should be capitalized or accompanied by the <sup>TM</sup> or ® symbol wherever they appear and be accompanied by the generic terminology. Although the use of trademarks is permissible in patent application, the proprietary nature of the trademarks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

Appropriate correction is required.

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Art Unit: 1644

4. Claims 1-7 and 25 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 1-7 and 25 encompass a method of controlling adhesions by introducing a human recombinant phage antibody onto or into an area of the body following surgical procedures to inhibit adhesion or scar formations.

The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims. The disclosure appears to disclose only antibodies to growth factors such as transforming growth factors beta (TGF- $\beta$ ) (see pages 1-3 of the instant specification). The instant claims encompass in their breadth *any human recombinant phage antibody*.

In vitro and animal model studies have not correlated well with in vivo clinical trial results in patients. Since the therapeutic indices of antibodies which inhibit surgical adhesion or scar formation can be species- and model-dependent, it is not clear that human antibodies such as anti-TGF $\beta$  antibody would be effective in inhibiting adhesion and scar formation following a surgical procedure.

Pharmaceutical therapies in the absence of in vivo clinical data are unpredictable for the following reasons; (1) the protein may be inactivated before producing an effect, i.e. such as proteolytic degradation, immunological inactivation or due to an inherently short half-life of the protein; (2) the protein may not reach the target area because, i.e. the protein may not be able to cross the mucosa or the protein may be adsorbed by fluids, cells and tissues where the protein has no effect; and (3) other functional properties, known or unknown, may make the protein unsuitable for in vivo therapeutic use, i.e. such as adverse side effects prohibitive to the use of such treatment. See page 1338, footnote 7 of Ex parte Aggarwal, 23 USPQ2d 1334 (PTO Bd. Pat App. & Inter. 1992).

In addition, there does not appear to be sufficient guidance and working examples in the specification as filed as to how the skilled artisan would make and use the claimed “providing a human recombinant phage antibody”. The state of the art at the time the invention was made recognized that not all antibodies to growth factors are effective in inhibiting scar formation after surgery. For example, Lucas et al. (Journal of Surgical Research. 1996. 65:135-138) show that panspecific anti-TGF- $\beta$  to TGF- $\beta$ , 2 and 3 or anti-TGF- $\beta$ 2 have no effect on scar formation (see entire document, particularly Results and Discussion on pages 136-137). Given the extensive variation permitted by the instant claim language and the lack of working examples, the skilled artisan would not reasonably predict such “a human recombinant phage antibody” to have the same function as the instant claimed invention.

Consequently, the experimentation left to those skilled in the art to determine which “human recombinant phage antibody” would still result in having the same function as those antibodies disclosed in the specification as-filed is unnecessarily, improperly, and extensive and undue.

Art Unit: 1644

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Ferguson et al. (US Patent 5,972,335) (see entire document).

Ferguson et al. teach and claim methods of controlling adhesions and scar formations following surgical procedures or injuries of central nervous system (CNS) or abdominal area by locally infiltrating antibodies such as phage antibodies against growth factors including TGF- $\beta$ 1 (see entire document, particularly columns 1-5 and claims 1-3 and 6).

Given that Ferguson et al. teach that the methods of controlling adhesion using phage antibodies can treat human (e.g. see column 5 in particular) and that human phage antibodies were generated for use in human therapies at the time the invention was made, the ordinary artisan would have immediately envisaged that Ferguson et al. taught methods of treating scar formations using human recombinant phage antibodies to growth factors such as anti-TGF- $\beta$ 1 antibody in areas such as abdomen and spine.

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams (US Patent 6,514,515) and Ferguson et al. (US Patent 5,972,335) in view of Smith et al. (US Patent 5,855,885) and Reff et al. (Critical Reviews in Oncology/Hematology 2001. 40:25-35).

Williams teaches that bioabsorbable biocompatible polymers can be used for wound dressing, drug delivery, and stent in combination with biologically active factors such as antibodies in tissues of gastrointestinal and spinal cord (see entire document, particular Detailed Description of the Invention on columns 3-8).

The teachings of Ferguson et al. have been discussed, supra.

The reference teachings differ from the claimed invention by not describing human recombinant phage antibody.

However, methods of making human recombinant phage antibody and their advantages were well known in the art at the time the invention was made. For example, Smith et al. teach methods of producing antibodies including human antibodies from bacteriophage (see entire document, particularly Detailed Description of the Preferred Embodiments on columns 8-13). Smith et al. further teach that phage antibody expression libraries can be easily generated by cloning the amplified VH and VL genes directly into bacteriophage vectors allowing scope for producing tailor-made antibodies for desired binding specificities (e.g. see Background of the Invention on columns 1-5, in particular).

Reff et al. teach that human antibodies made from techniques such as recombinant phage library are better tolerated in human and have reduced antigenicity of murine antibodies and human anti-mouse antibody response (HAMA).

It would thus have been obvious to the ordinary artisan at the time the invention was made to develop methods of treating scar formation and inhibiting surgical adhesions by delivering antibodies to growth factors such as TGF- $\beta$ 1 using stent. The ordinary artisan would have been motivated to do so because antibodies such as anti-TGF- $\beta$ 1 antibody can be used locally to treat scar formation after surgery and stent made of bioabsorbable biocompatible polymers in combination with biologically active factors such as antibodies can be used in tissues of gastrointestinal and spinal cord.



Given the teachings of Ferguson et al. regarding methods of controlling surgical adhesion and scar formation using antibodies such as anti-TGF- $\beta$ 1 antibody, the teachings of Williams regarding antibody delivery using stent based technology, and the teachings of Smith et al. and Reff et al regarding the methods of making human recombinant phage antibody and the advantages of using human antibody, the ordinary artisan at the time the invention was made would have had a reasonable expectation of success of developing methods of controlling surgical adhesion using antibodies such as human anti-TGF- $\beta$ 1 antibody produced by recombinant phage technology and released by stent.

Therefore, the invention as a whole was *prima facie* obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references, especially in the absence of evidence to the contrary.

9. No claim is allowed.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chun Crowder whose telephone number is (571) 272-8142. The examiner can normally be reached Monday through Friday from 8:30 am to 5:00 pm. A message may be left on the examiner's voice mail service. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Chan can be reached on (571) 272-0841. The fax number for the organization where this application or proceeding is assigned is 571-273-8300.


Art Unit: 1644

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chun Crowder, Ph.D.

Patent Examiner

May 22, 2006

  
PHILLIP GAMBEL, PH.D. JD  
PRIMARY EXAMINER  
R 1600  
5/26/06